

## Message Coding for Digital Watermark Applications

### Abstract of the Disclosure

This disclosure describes methods for coding messages for digital watermark applications. One method combines the use of different error correction coding schemes to error correction encode an auxiliary message, and then imperceptibly embeds that coded message into a media signal, such as an image, video or audio signal. A particular example of this method is a concatenated code where the auxiliary message is encoded using convolution coding and Reed Solomon coding before being embedded in a host media signal in a digital watermarking process. Another method combines M-ary signaling with error correction coding to encode the auxiliary message, and then imperceptibly embeds the resulting message signal into a host media signal. One specific example is illustrated where a watermark embedder applies Reed Solomon coding to an auxiliary message, and then M-ary modulates the resulting Reed Solomon coded message. The watermark embedder then embeds the M-ary modulated message into a host media signal. Another example employs convolution coding and then M-ary modulation.

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